Instructions - Parts

Automatic XT Spray Guns

311051F

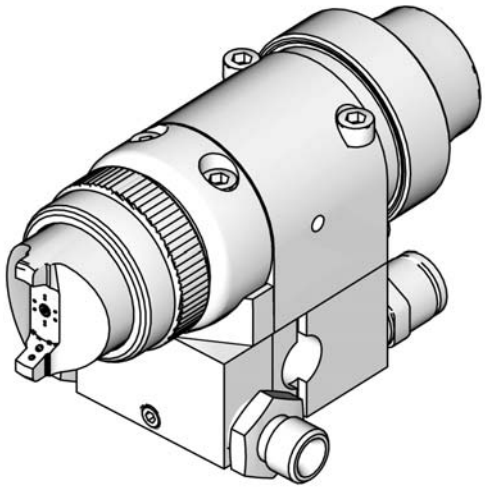
ENG

Airspray, HVLP, and Compliant guns for spraying paints and coatings.

See page 3 for model information.

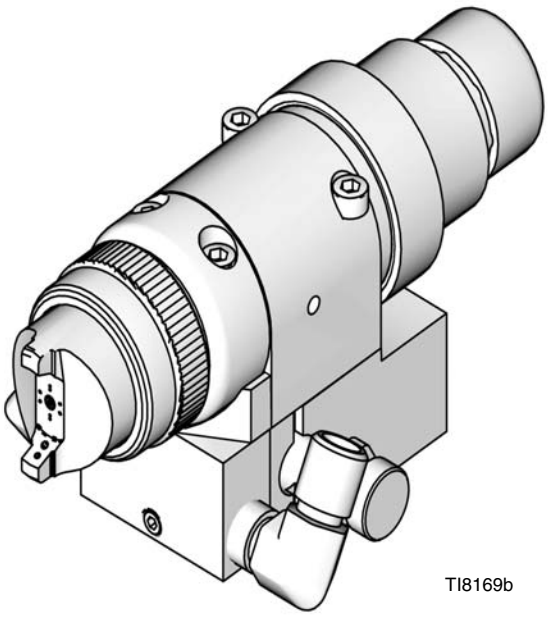
100 psi (0.7 MPa, 7 bar) Maximum Working Fluid Pressure
100 psi (0.7 MPa, 7 bar) Maximum Working Air Pressure

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.



TI8085b

Part No. 249369 Airspray Gun shown mounted on Part No. 288217 Manifold.



TI8169b

Part No. 249377 Airspray Gun with fluid control shown mounted on Part No. 288223 Manifold.

CE Ex II 2 G c T6

PROVEN QUALITY. LEADING TECHNOLOGY.

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Related Manuals

The Automatic XT Spray Guns manual is available in the following languages. See the following chart for specific language and part number.

Manual	Language
311051	English
311637	Chinese
311638	Danish
311639	Dutch
311640	Finnish
311641	French
311642	German
311643	Italian

Manual	Language
311644	Japanese
311645	Korean
311646	Norwegian
311647	Polish
311648	Russian
311649	Spanish
311650	Swedish

Models

A manifold is required for each gun to be installed.
Refer to the **Parts** section for manifold information.

Orifice Size in. (mm)	HVLP	Compliant	Airspray
.030 (0.75)	249388	249407	249369
.042 (1.0)	249389	249408	249370
.055 (1.4)	249390	249409	249371
.070 (1.8)	249391	249410	249372
*.042 (1.0) Hardened SST	249394	288049	249375
*.055 (1.4) Hardened SST	249395	288050	249376
.030 (0.75) with Fluid Control Knob	249396	249411	249377
.042 (1.0) with Fluid Control Knob	249397	249412	249378
.055 (1.4) with Fluid Control Knob	249398	249413	249379
.070 (1.8) with Fluid Control Knob	249399	249414	249380

* *Hardened SST needle tip/nozzle (not recommended for thin fluids). All other models have PEEK needle tip.*

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

⚠ WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

PRESSURIZED EQUIPMENT HAZARD

Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.

⚠ WARNING

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDS's to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:

- Protective eyewear
- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Gloves
- Hearing protection

Selection Charts

TERMS:

Light Fluid: Up to 18 seconds with No. 2 Zahn cup (20 centipoise)

Medium Fluid:19 to 28 seconds with No. 2 Zahn cup (20-64 centipoise)

Heavy Fluid:Greater than 28 seconds with No. 2 Zahn cup (greater than 64 centipoise) -- 2.8 Volatile Organic Compounds, High-solid Polyurethanes, Heavy Water-borne Enamels

HVLP Spray Gun Assemblies

Gun Assy. Part No.	Includes: Needle/ Nozzle Kit Part No.	Includes: 321 Air Cap Reorder Part No.	Orifice Size in. (mm)	Material Usage: Viscosity	Material Usage: Flow oz./min. (l/min.)
249388	15F829	288134	.030 (0.75)	light	4-10 (0.12-0.30)
249389	15F830	288134	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249390	15F831	288134	.055 (1.4)	medium	12-18 (0.36-0.54)
249391	15F832	288134	.070 (1.8)	medium-heavy	16-20 (0.48-0.60)
249394*	15F835*	288134	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249395*	15F836*	288134	.055 (1.4)	medium	12-18 (0.36-0.54)
249396†	15F829	288134	.030 (0.75)	light	4-10 (0.12-0.30)
249397†	15F830	288134	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249398†	15F831	288134	.055 (1.4)	medium	12-18 (0.36-0.54)
249399†	15F832	288134	.070 (1.8)	medium-heavy	16-20 (0.48-0.60)

** Hardened SST needle tip/nozzle (not recommended for thin fluids). All other models have PEEK needle tip.*
† With Fluid Control Knob (for fine adjustment of fluid flow).

Compliant Spray Gun Assemblies

Gun Assy. Part No.	Includes: Needle/ Nozzle Kit Part No.	Includes: 006 Air Cap Reorder Part No.	Orifice Size in. (mm)	Material Usage: Viscosity	Material Usage: Flow oz./min. (l/min.)
249407	15F829	288132	.030 (0.75)	light	4-10 (0.12-0.30)
249408	15F830	288132	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249409	15F831	288132	.055 (1.4)	medium	12-18 (0.36-0.54)
249410	15F832	288132	.070 (1.8)	medium-heavy	16-20 (0.48-0.60)
288049*	15F835*	288132	.042 (1.0)	light-medium	8-14 (0.24-0.42)
288050*	15F836*	288132	.055 (1.4)	medium	12-18 (0.36-0.54)
249411†	15F829	288132	.030 (0.75)	light	4-10 (0.12-0.30)
249412†	15F830	288132	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249413	15F831	288132	.055 (1.4)	medium	12-18 (0.36-0.54)
249414†	15F832	288132	.070 (1.8)	medium-heavy	16-20 (0.48-0.60)

** Hardened SST needle tip/nozzle (not recommended for thin fluids). All other models have PEEK needle tip.*
† With Fluid Control Knob (for fine adjustment of fluid flow).

Airspray Gun Assemblies

Gun Assy. Part No.	Includes: Needle/ Nozzle Kit Part No.	Includes: 315 Air Cap Reorder Part No.	Orifice Size in. (mm)	Material Usage: Viscosity	Material Usage: Flow oz./min. (l/min.)
249369	15F829	288133	.030 (0.75)	light	4-10 (0.12-0.30)
249370	15F830	288133	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249371	15F831	288133	.055 (1.4)	medium	12-18 (0.36-0.54)
249372	15F832	288133	.070 (1.8)	medium-heavy	16-20 (0.48-0.60)
249375*	15F835*	288133	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249376*	15F836*	288133	.055 (1.4)	medium	12-18 (0.36-0.54)
249377†	15F829	288133	.030 (0.75)	light	4-10 (0.12-0.30)
249378†	15F830	288133	.042 (1.0)	light-medium	8-14 (0.24-0.42)
249379†	15F831	288133	.055 (1.4)	medium	12-18 (0.36-0.54)
249380†	15F832	288133	.070 (1.8)	medium-heavy	16-20 (0.48-0.60)

** Hardened SST needle tip/nozzle (not recommended for thin fluids). All other models have PEEK needle tip.*
† With Fluid Control Knob (for fine adjustment of fluid flow).

Proper Needle/Nozzle Selection

The spray gun's needle/nozzle kits range in size to provide different fluid flow rates.

As a general guideline, use the fluid nozzle that will give the required flow with the needle fully triggered at a fluid pressure of 5-20 psi (0.035 MPa, 3.5 bar - 0.14 MPa. 14 bar)

For low flow rates or light viscosity fluid, select the smaller nozzle sizes.

For high flow rates or high viscosity fluid, select the larger nozzle sizes.

For thicker, abrasive fluids, hardened SST needle tips and nozzles are recommended.

Gun Selection

HVLP Guns

An HVLP gun is a high transfer efficiency gun that limits the air pressure at the air cap to 10 psi (0.07 MPa, 0.7 bar) maximum. In some areas, an HVLP gun is required for compliance with environmental standards.

Compliant Guns

A compliant gun is a high transfer efficiency gun that has been tested to have a transfer efficiency greater than or equal to HVLP guns. In addition, the compliant air cap consumes much less air than the HVLP air cap.

The Graco compliant guns have no restrictions on air cap pressures, but the gun inlet pressure must remain under 30 psi (0.21 MPa, 2.1 bar) to remain in compliance.

Airspray Guns

An airspray gun has excellent atomization and high production rates typically with some reduction in transfer efficiency.

Air Caps

The chart below lists the air caps available for pressure feed, gravity, and siphon feed guns.

Spray Gun	Air Cap ID	Typical Pattern Width* in. (mm)	Gun Feed	Nozzle Orifice in. (mm)	Part Number
HVLP	321A	15 (381)	Pressure Feed	.030-.070 (.75-1.8)	288134
HVLP	322	15 (381)	Pressure Feed	.086 (2.2)	234754†
HVLP	323	15 (381)	Pressure Feed	.110 (2.8)	234755†
Compliant	006A	11 (279)	All Models	.030-.070 (.75-1.8)	288132
Airspray	315A	13 (330)	Pressure Feed	.030-.070 (.75-1.8)	288133
Airspray	318	10 (254)	Pressure Feed	.086 (2.2)	234760†
Airspray	319	10 (254)	Pressure Feed	.110 (2.8)	234761†
Airspray	313	10 (254)	Pressure Feed	.030-.070 (.75-1.8)	234756†
Airspray	316	10 (254)	Pressure Feed	.030-.070 (.75-1.8)	234758†

* Measured with gun nozzle 8 in. (203 mm) from target surface.

† Caps do not have alignment pin feature.

Air Flow

All tests were completed with the 0.055 in. (1.4 mm) nozzle and standard air cap for each gun model.

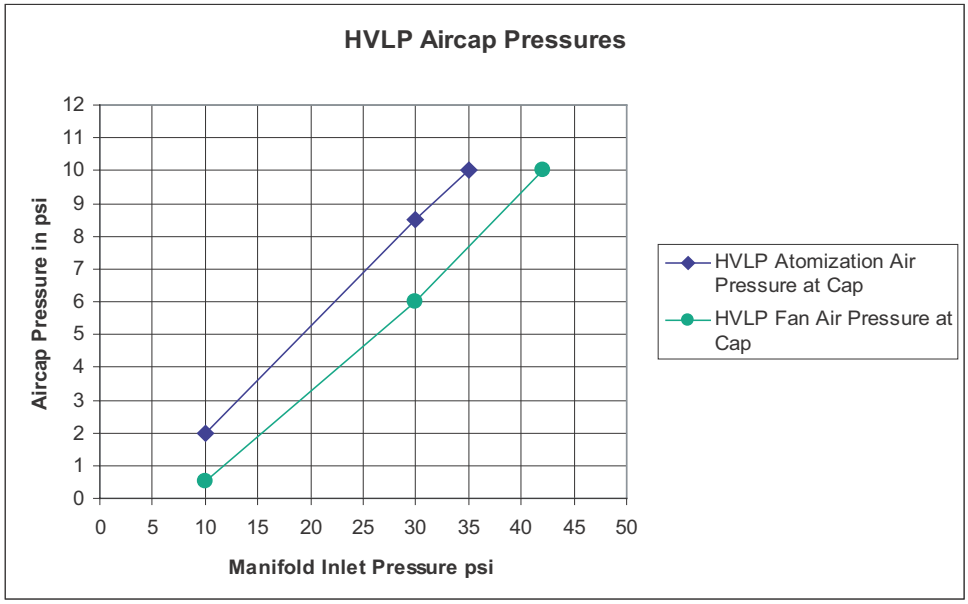


FIG. 1: HVLP Gun Air Cap Pressure

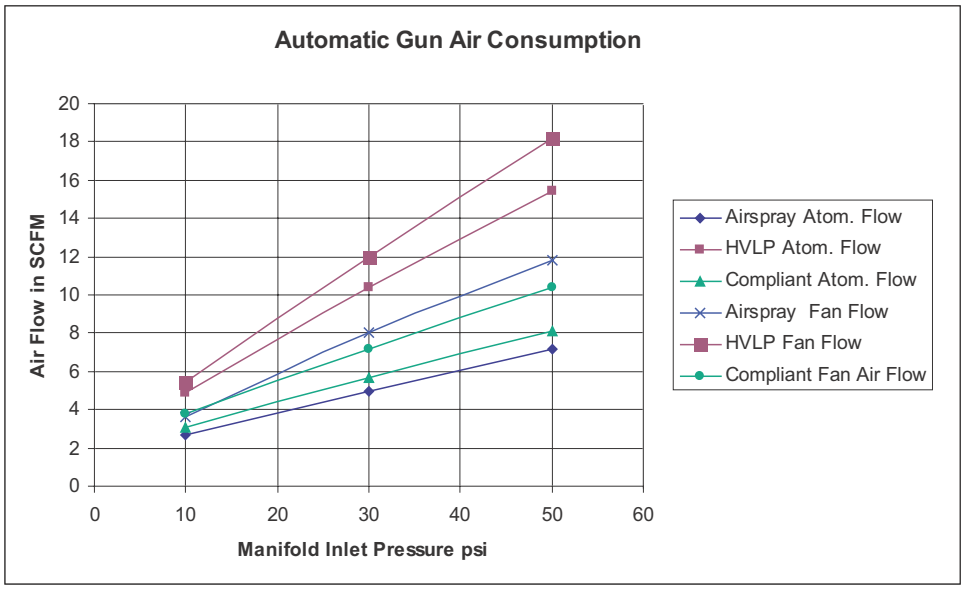


FIG. 2: Automatic Gun Air Consumption

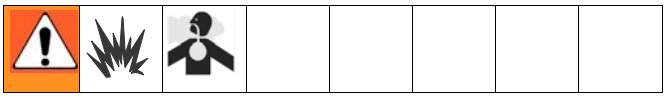
Installation

The Automatic XT spray guns were designed to produce the highest quality finish with today's fluids as well as the low V.O.C. (volatile organic compound) fluids of tomorrow.

This spray gun can spray most coatings or finishes currently being used for automotive, industrial, aerospace, marine, wood, plastic and architectural applications, while easily operating from paint delivery systems, such as pressure pots or remote pumps for production line operation.

The air regulator must have a minimum air flow capacity of 30 scfm at 100 psi (0.7 MPa, 7 bar) air pressure.

Ventilate Spray Booth



Check and follow all National, State, and Local codes regarding air exhaust velocity requirements.

Check and follow all local safety and fire codes.

Configure Gun and Manifold

The gun is supplied with an internal fluid plug and seals (19, 20, 21). To use the gun in a circulating system, remove the internal plug. In a non-circulating system, leave the plug in place to minimize flush time.

Circulating System

1. Apply anti-seize lubricant to the threads and mating faces of the manifold (101) and the elbows (107), supplied unassembled.
2. Install the elbows (107) in both fluid ports of the manifold (101).
3. Connect the fluid supply line to one elbow and the fluid return line to the other. The manifold fluid ports are reversible.
4. Install the gun on the manifold, using the four screws (13). Start the threads of all four screws. Tighten the front two screws first, and then tighten the back two. Torque all four screws evenly to 65 in-lb (7.3 N•m).

Non-circulating System

1. See FIG. 3. See Apply anti-seize lubricant 222955 to the threads and mating faces of the manifold (101), plug (109), and elbow (107), supplied unassembled.
2. Install an elbow (107) in one fluid port of the manifold (101), and a plug (109) in the other port.
3. Install the internal plug (19) in the gun fluid port on the same side as the manifold plug.
4. Connect the fluid supply line to the fluid inlet elbow (107).
5. Install the gun on the manifold, using the four screws (13). Start the threads of all four screws. Tighten the front two screws first, and then tighten the back two. Torque all four screws evenly to 65 in-lb (7.3 N•m).

△1 Remove when used in circulating systems.

△2 Replace with elbow (107) when used in circulating systems.

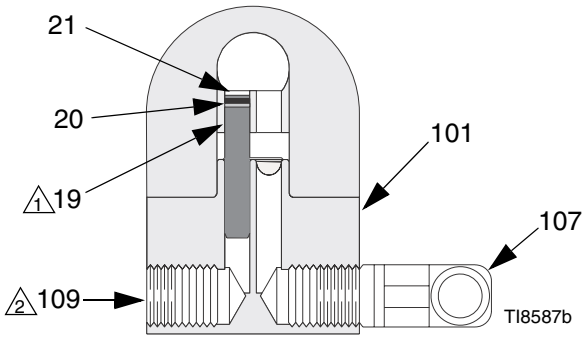


FIG. 3: Non-Circulating Setup Shown (cutaway view)

Install Air Fittings

1. Install the supplied 1/4 in. tube fitting into the cylinder (CYL) air port.
2. Install 3/8 in. tube fittings into the atomization (ATOM) air port and the fan (FAN) air port.

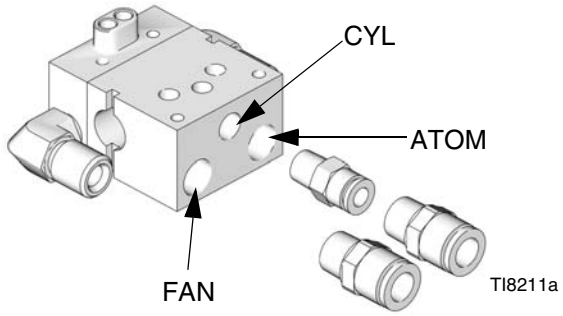
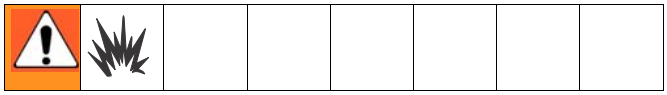


FIG. 4: Air Fittings

Ground System



The following grounding instructions are minimum requirements for a system. Your system may include other equipment or objects that must be grounded. Check your local electrical code for detailed grounding instructions for your area and type of equipment. Your system must be connected to a true earth ground.

Ground Pump/Fluid Supply

Ground the pump by connecting a ground wire and clamp between the fluid supply and a true earth ground as instructed in your separate pump instruction manual.

Ground Air Compressors and Hydraulic Power Supplies

Ground the air compressors and hydraulic power supplies according to the manufacturer recommendations.

Ground Spray Gun

Ground the spray gun by mounting the manifold to a properly grounded reciprocator, robot, or stationary mount. Check the electrical resistance between the manifold and a true earth ground. The resistance must be less than 1 megohm.

Ground Fluid Supply Container

Ground the fluid supply container according to local code.

Ground Object Being Sprayed

Ground the object that is being sprayed according to local code.

Ground Solvent Pails

Ground all solvent pails that are used when flushing according to local code. Use only metal pails, which are conductive. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.

Mount Gun

Reciprocating Arm Rod Mount

To mount the gun on a reciprocating arm rod [0.5 in. (13 mm) diameter maximum]:

1. Insert the mounting bar (A) through the hole in the manifold as shown in FIG. 5.

Use the 1/8 in. alignment pin (P) to assist in orienting the gun.

2. Secure the gun to the bar by tightening the mounting screw (B).

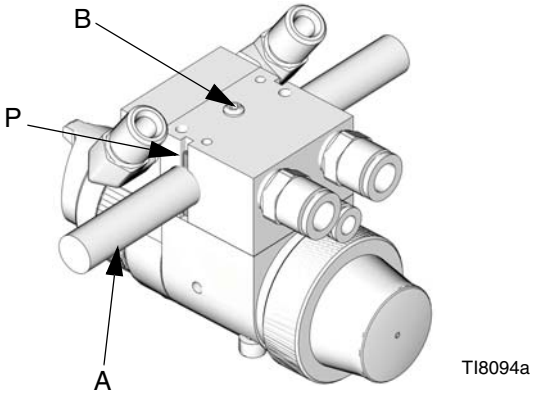


FIG. 5: Reciprocating Arm Mount

Stationary Support

To mount the gun on a stationary support (refer to FIG. 6 and **Mounting Hole Layout**, page 35):

1. Align the manifold with the alignment pins. Locate alignment pins and holes per the **Mounting Hole Layout** illustration, page 35.

2. Secure the gun to the support with two M5 x 0.8 capscrews (C). The screws must be long enough to engage the threaded holes in the gun manifold to a depth of 1/4 in. (6 mm).

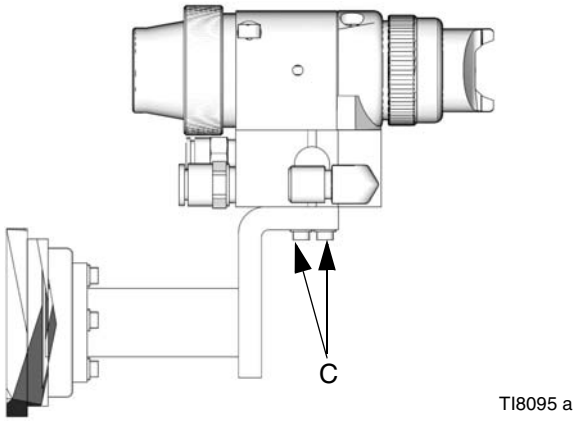


FIG. 6: Stationary Support Mount

Retrofit Adapter Plate

The retrofit adapter plate enables the manifold to be attached to a variety of bolt patterns.

To mount the gun using the retrofit adapter plate (kit 288197):

1. Mount adapter plate to manifold using the three screws provided with the kit (FIG. 7).

2. Bolt plate to mounting surface using four M5 x 0.8 capscrews. Refer to the **Mounting Hole Layout**, page 36.

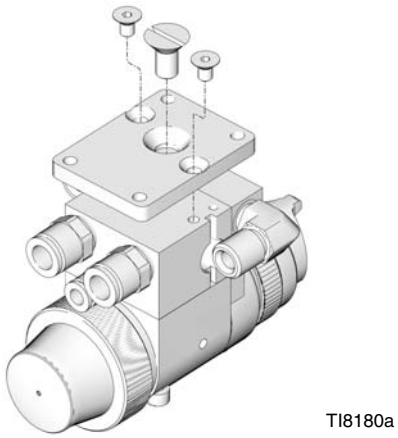


FIG. 7: Retrofit Adapter Plate Mount

Setup

Connect Air Line

You must install an air pressure regulator (F) on each gun air line to control air pressure to the gun. See FIG. 8.

If your regulated air source does not have a filter, install an air filter (G) on each air line to ensure a dry, clean air supply to the gun. Dirt and moisture can ruin the appearance of your finished workpiece. See FIG. 8.

Install a bleed type air shutoff valve (E) on each gun air supply line, downstream of the gun air regulator, to shut off air to the gun.

1. For manifolds with a separate ATOM and FAN port, the gun cylinder, fan, and atomization air must be supplied and regulated separately. For the manual fan valve manifold, only one supply line is required for both atomization and fan air.

   The gun atomizing and fan air inlets are 3/8 in. O.D. tubing. The cylinder air inlet accepts 1/4 in. (6.3 mm) O.D. tubing. Use 3/8 in. (9.5 mm) O.D. tubing for fan and atomization air to minimize excessive pressure drop in the hoses.

2. Connect each air hose (D) to a regulated air supply line (H).

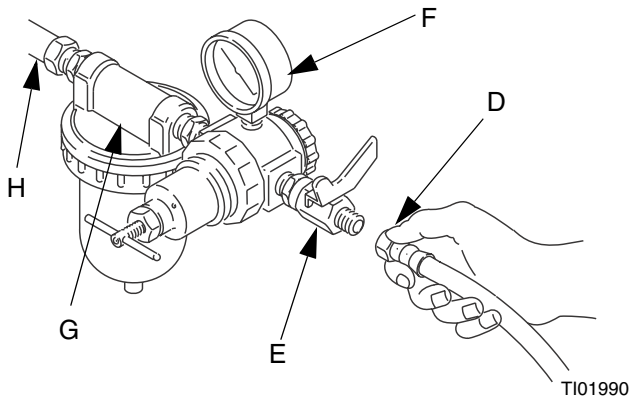


FIG. 8: Connect Air Line

Connect Fluid Hose

Before connecting the fluid line, blow it out with air and flush it with solvent. Use solvent that is compatible with the fluid to be sprayed.

Install a fluid regulator (L) on the fluid line to control fluid pressure to the gun. See FIG. 9.

Install a fluid shutoff valve (M) to shut off the fluid supply to the gun. See FIG. 9.

Filter the fluid line of coarse particles and sediment to avoid clogging the fluid nozzle and causing finishing defects.

1. Connect the fluid supply hose (J) to the gun fluid inlet (S) 1/4 npsm thread. See FIG. 10.
2. Connect the other end of the fluid hose (J) to a regulated fluid supply outlet (M). See FIG. 9.
3. **In a circulating system**, connect a grounded fluid return hose to the gun fluid outlet (T). See FIG. 10.

   In a non-circulating system, remove the gun fluid outlet fitting (T) and plug the outlet port with the pipe plug supplied. See FIG. 10.

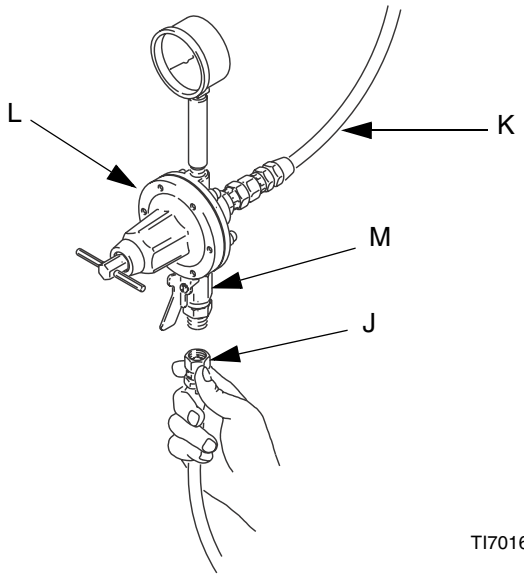
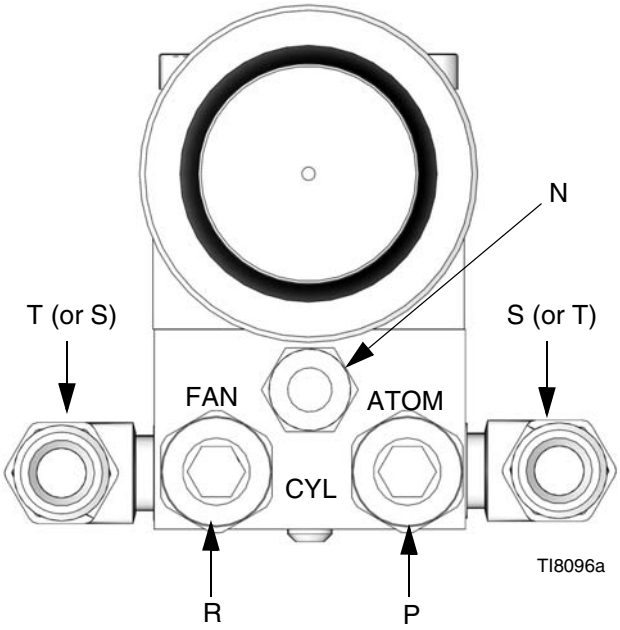


FIG. 9: Connect Fluid Hose

KEY
N Cylinder Air Inlet: accepts 1/4 in. (6.3 mm) O.D. tubing
P Atomization Air Inlet: 3/8 in, (9.5 mm) O.D. tubing
R Fan Air Inlet: 3/8 in. (9.5 mm) O.D, tubing
S Fluid Inlet: 1/4 npsm
T Fluid Outlet (circulating gun only): 1/4 npsm

Side Mounted Manifold Ports



Bottom Mounted Manifold Ports

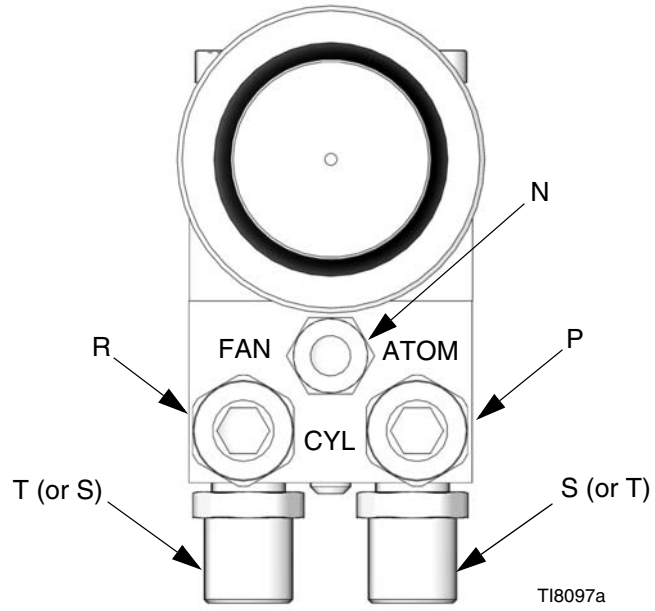


FIG. 10: Manifold Ports

Flush Spray Gun

Before running any paint through the spray gun:

1. Flush the gun with a solvent that is compatible with the fluid to be sprayed, using the lowest possible fluid pressure and a grounded metal container.
2. Perform **Pressure Relief Procedure**; see page 17.

Position Air Cap

Air caps are factory-set with the alignment pin (A) set to a vertical spray pattern. To change the air cap to a horizontal spray pattern, use a needle nos pliers to unscrew the alignment pin (A) and relocate it to the horizontal spray pattern hole. When relocating the pin use low strength thread locker. Torque to 1.5-2.5 in-lb (0.2-0.3 N•m). ***Do not overtighten***. Refer to FIG. 11.

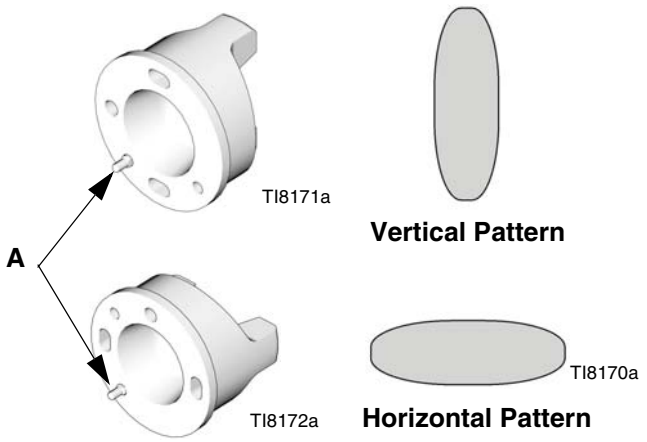


FIG. 11: Position Air Cap

Adjust Spray Pattern

Do not exceed 100 psi (0.7 MPa, 7 bar) maximum fluid and air pressure. Higher pressures can cause parts to rupture and result in serious injury.

The spray gun fluid flow is controlled by the fluid pressure regulator and the fluid control knob. Use the fluid pressure regulator to adjust the general fluid flow and the fluid control knob to make precise fluid flow adjustments.

CAUTION
Use caution when operating the fluid control valve near the closed position. The plastic needle tip may be damaged if forced too hard against the nozzle seat by the fluid control valve.

Follow these steps to establish the correct fluid flow and air flow:

1. To achieve desired flow, adjust the fluid flow using the fluid pressure regulator (L) installed in the gun fluid line. Typical industrial flow rates will vary with regulator pressures from 5 to 30 psi (34 to 210 kPa, 0.3 to 2.1 bar). If the fluid pressure is too low at the desired flow rate, install a smaller nozzle. If the fluid pressure is too high, install a larger nozzle.

   For spray guns equipped with the fluid control knob, you can make flow rate changes at the spray gun. Rotate the fluid control knob clockwise to reduce the flow.

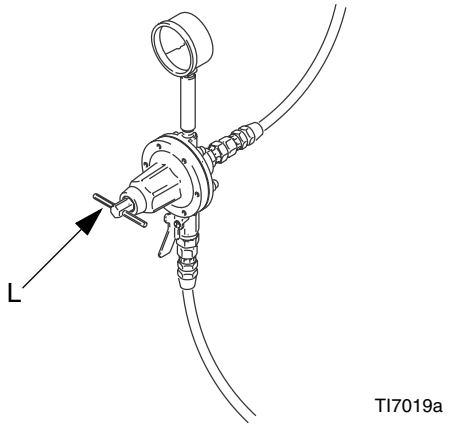


FIG. 12: Fluid Pressure Regulator

A larger fluid nozzle at a reduced fluid pressure will maintain the same flow rate, but the fluid stream (velocity) will slow down. When air is applied, this allows air to act on the fluid longer and improve the atomization.

2. Using the air pressure regulator (F), set the fan and atomizing air supply pressure per Table 1. Use these suggested settings as a starting point.

Table 1: Suggested Starting Settings

	Fan Air (psi)	Atomization Air (psi)
Airspray	35	35
HVLP	25	25
Compliant	18	25

HVLP and Compliant Gun Limits

HVLP Guns: local laws may limit the maximum pressure to 10 psi (70 kPa, 0.7 bar) at the air cap for compliance. 35 psi (25 kPa, 2.5 bar) inlet air yields 10 psi (70 kPa, 0.7 bar) at the air cap. To measure pressure at the air cap, use the accessory tapped air cap. See **Accessories**, page 33.

Compliant Guns: the maximum inlet pressure to the manifold is 30 psi atomizing air.

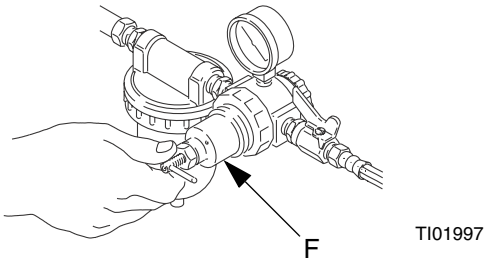


FIG. 13: Air Pressure Regulator

3. Test the spray pattern atomization while keeping the gun a consistent distance, about 6 to 8 inches (150 to 200 mm), from the test piece.

   Check the atomization quality. Increase the gun atomizing air supply pressure with the air pressure regulator in 5 psi (34 kPa, 0.3 bar) increments until you obtain the desired atomization.

   For the best transfer efficiency, use the lowest setting needed to achieve desired finish quality.

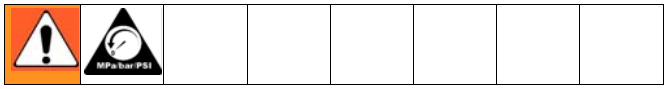
4. If the spray pattern is too wide or split, reduce the fan air pressure (or slightly close the fan adjustment valve on manifold 288223).

   To further control the spray pattern of *airspray guns only*, use an alternate air cap. For a list of available air caps, refer to **Accessories**, page 33.

   Reducing the fan air pressure to 0 psi (or fully closing the fan adjustment valve) will produce a round pattern.

Operation

Pressure Relief Procedure



1. Turn off all bleed type air valves and all other air and fluid supplies to the gun.
2. Trigger the gun into a grounded metal waste container to relieve air and fluid pressure.

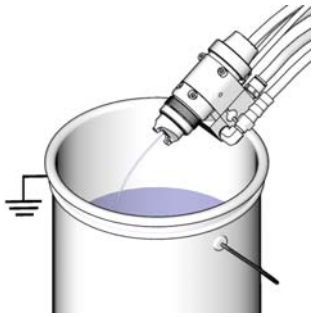


FIG. 14: Pressure Relief

Apply Fluid

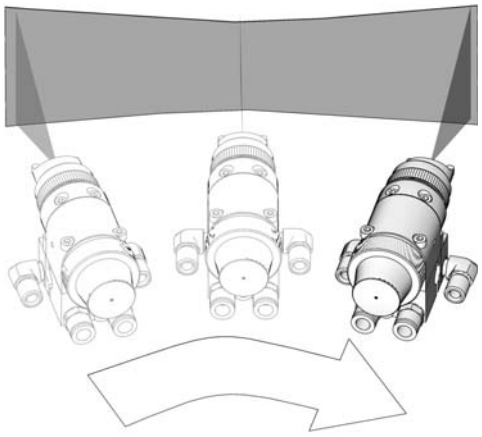
The spray gun has a built-in lead and lag operation. When triggered, the gun begins emitting air before the fluid is discharged. When the trigger actuation air is stopped, the fluid stops before the air flow stops. This helps ensure that the spray is atomized and prevents fluid buildup on the air cap and tip.

Adjust the system control device, if it is automatic, so the gun starts spraying just before meeting the part and stops as soon as the part has passed. Keep the gun a consistent distance, 6 to 8 in. (150 to 200 mm), from the surface of the object being sprayed.

To achieve best results when applying fluid:

- Keep gun perpendicular and 6 to 8 in. (150 to 200 mm) from object being sprayed.
- Use smooth, parallel strokes across surface to be sprayed with 50% overlap.

Incorrect



Correct

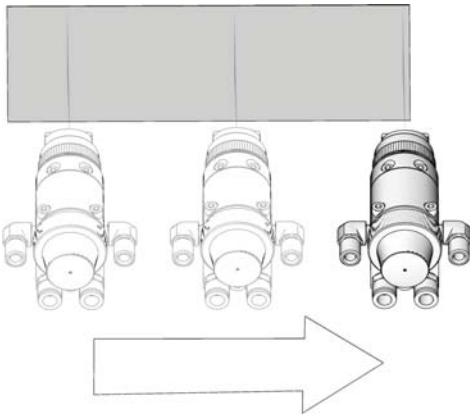


FIG. 15: Correct Spray Method

Daily Gun Care

CAUTION
Methylene chloride with formic or propionic acid is not recommended as a flushing or cleaning solvent with this gun as it will damage aluminum and nylon components.

CAUTION

Solvent left in gun air passages could result in a poor quality paint finish. Do not use any cleaning method which may allow solvent into the gun air passages.

Do not point the gun up while cleaning it.

TI8100a

Do not immerse the gun in solvent.

TI8101a

Do not wipe the gun with a cloth soaked in solvent; ring out the excess.

TI4827a

Do not use metal tools to clean the air cap holes as this may scratch them; scratches can distort the spray pattern.

TI8175a

General System Maintenance

- Perform **Pressure Relief Procedure**, page 17.
- Clean the fluid and air line filters daily.
- Check for any fluid leakage from the gun and fluid hoses. Tighten fittings or replace equipment as needed.
- Flush the gun before changing colors and whenever you are done operating the gun.

Clean and Flush Gun

1. Perform **Pressure Relief Procedure**, page 17.
2. Shut off the gun fan and atomizing air.
3. Supply a compatible solvent to the gun fluid inlet.
4. Point the gun down into a grounded metal container, and flush the gun with solvent until all traces of paint are removed from the gun passages.
5. Perform **Pressure Relief Procedure**, page 17.
6. Disconnect the solvent supply.
7. Remove the air cap retaining ring and air cap.

CAUTION
Trigger the gun or remove the piston cap whenever you tighten or remove the nozzle. This keeps the needle seat away from the nozzle seating surface and prevents the seat from being damaged.

8. Clean the air cap retaining ring, air cap, and fluid nozzle with solvent.
9. Dip the end of a soft-bristle brush into a compatible solvent. Do not continuously soak the brush's bristles with solvent and do not use a wire brush.

FIG. 16:

10. With the gun pointed down, clean the front of the gun, using the soft-bristle brush and solvent.
11. Scrub the air cap retaining ring, air cap, and fluid nozzle with the soft-bristle brush (see FIG. 17). To clean out air cap holes, use a soft implement, such as a toothpick, to avoid damaging critical surfaces. Clean the air cap and fluid nozzle daily, minimum. Some applications require more frequent cleaning.

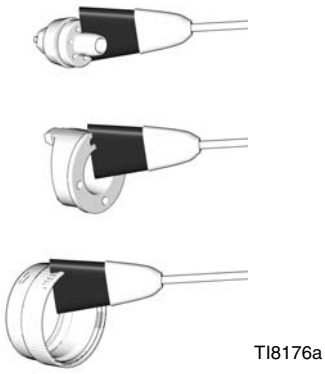
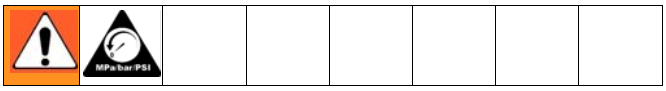


FIG. 17:

12. Install the air cap retaining ring and air cap.
13. Dampen a soft cloth with solvent and wring-out the excess. Point the gun down and wipe off the outside of the gun.

Troubleshooting



Check all possible remedies in the troubleshooting charts before disassembling the gun.

Some improper patterns are caused by the improper balance between air and fluid. Refer to **Spray Pattern Troubleshooting**, page 22.

General Troubleshooting

Problem	Cause	Solution
Fluid leakage through venting holes.	Worn packing (17) or needle (5).	Replace packing or needle.
Air leakage through venting hole.	Worn o-ring (9) or gasket (15).	Check and replace parts as needed.
Air leakage from back of gun.	Worn o-rings (8, 9).	Replace o-rings.
Air does not trigger.	Piston stem is disconnected from main body of piston assembly (3).	Replace piston assembly.
	Cylinder air pressure is too low.	Increase cylinder air pressure to 50 psi.
Air does not shut off.	Piston assembly not seating properly.	Clean/service piston assembly. Replace worn or swollen o-rings.
	Broken return spring (7).	Replace return spring.
	Swollen o-ring (8).	Replace o-rings.
	Worn piston stem o-rings (10, 11).	Replace o-rings.
	Bottom gasket (12) failed.	Replace gasket.
Fluid leakage from front of gun.	Fluid needle tip (5a) is dirty, worn, or damaged.	Clean or replace fluid needle tip or entire needle (5).
	Dirty or worn nozzle (23).	Clean or replace nozzle.
Fluid is present at air cap holes.	Nozzle (23) is insufficiently tightened or sealing o-ring (36) is damaged.	Tighten or replace o-ring.

Problem	Cause	Solution
Fluid needle will not trigger.	Loose or missing fluid needle stop (29) or setscrew (30).	Replace stop or tighten setscrew.
	Air leaking around piston (3).	Replace o-ring (8) or piston.
	Swollen piston o-ring (8).	Replace o-ring. Do not immerse piston in solvent.
	Insufficient air pressure on trigger.	Increase air pressure or clean air line.
	Plug (19) is in incorrect fluid port.	Move plug to fluid port consistent with manifold plumbing, unless you are using gun in a circulating system. If you are, all fluid ports in gun and on manifold should be open.
Fluid does not shut off.	Worn o-ring (11) or (9).	Replace o-ring.
	Piston cap (4) not fully tightened.	Tighten piston cap until it bottoms out.
	Spring (6) not in place.	Check spring position.
	Swollen piston o-ring (8).	Replace o-ring. Do not immerse piston in solvent

Spray Pattern Troubleshooting

Problem	Cause	Solution
Fluid flow is fluttering while spraying.	Fluid nozzle is not tight enough.	Tighten fluid nozzle to 60 in-lb (6.8 N•m).
	O-ring (36) is missing or damaged.	Replace o-ring.
	Fluid filter is clogged.	Check fluid filter.
Fluid flow fades while spraying high viscosity fluids.	Fluid pressure is too low, causing fluid flow to reduce when gun is elevated.	Raise fluid pressure at source or use a smaller fluid nozzle.
Pattern becomes off-set of heavy on ends.	Air cap horn holes plugged or damaged.	Clean air cap horn holes with non-metallic item such as a toothpick, or replace air cap.
Gun fluid pressure is too high with gun triggered.	Using needle/nozzle kit with too small orifice.	Use needle/nozzle kit with larger orifice.
Fluid system will not operate at low enough fluid pressure [below 10 psi (70 kPa, 0.7 bar)].	There is no fluid regulator, or air regulator on pressure pot is not sensitive enough at low pressures.	Add low pressure fluid regulator, or add more sensitive low pressure air regulator on pressure pot.

Service

Items Needed for Service

- 1/16 in. Hex Wrench - provided
- 3 mm Hex Wrench
- Adjustable Wrench
- 4 mm Hex Wrench
- Pliers
- Lubricant part no. 111265; see **Accessories**, page 33, to order
- Compatible Solvent

Replace Fluid Packings and Air Seals

Air Section Repair Kit 288171 and Fluid Section Repair Kit 288135 are available. Purchase the kits separately.

1. Perform **Pressure Relief Procedure**, page 17.
2. Unscrew the four screws (13) and remove the gun from the manifold.
3. Remove the air cap retainer (25) and air cap (24). See FIG. 18.

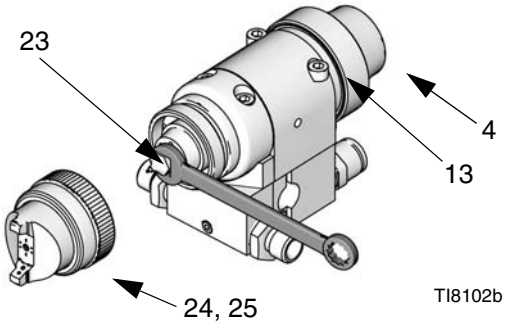


FIG. 18

4. Remove the piston cap (4) from the piston housing (1). Remove the springs (6, 7).
5. Using a 1/16 in. hex wrench loosen the fluid needle set screw (30). Remove the needle stop (29).
6. Pull the fluid needle (5) out the back of the gun.
7. Check the fluid needle (5) for damage or excessive wear. Replace the needle tip (5a) or the entire needle if necessary.
8. Remove nozzle (23). Check nozzle and o-ring (36) for damage. You may need to use a pick to remove o-ring from housing (2).

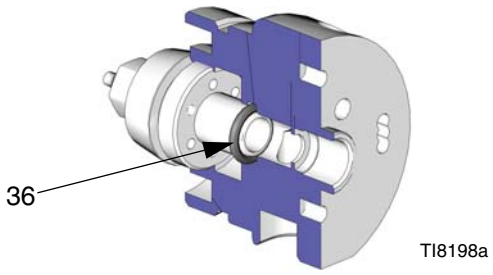


FIG. 19

9. Remove the piston. Using a pliers, pull the piston (3) out of the piston housing (1). See FIG. 20.
10. Unscrew the two screws (14) and separate the fluid housing (2) and the piston housing (1). Remove gasket (12) only if it needs to be replaced. See FIG. 20.

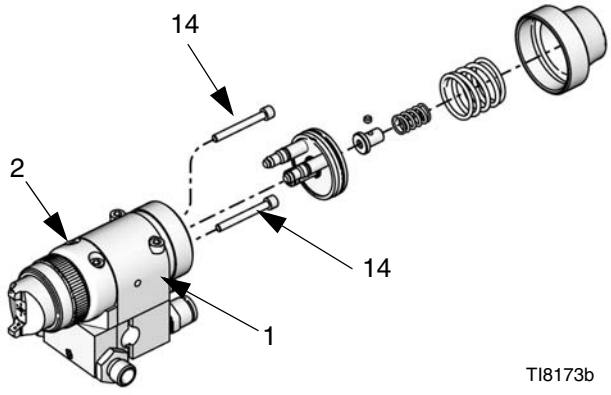


FIG. 20

11. Remove the packing nut (16) with a wrench.
12. Remove the fluid packing (17) from the nut (16). Discard the old fluid packing.

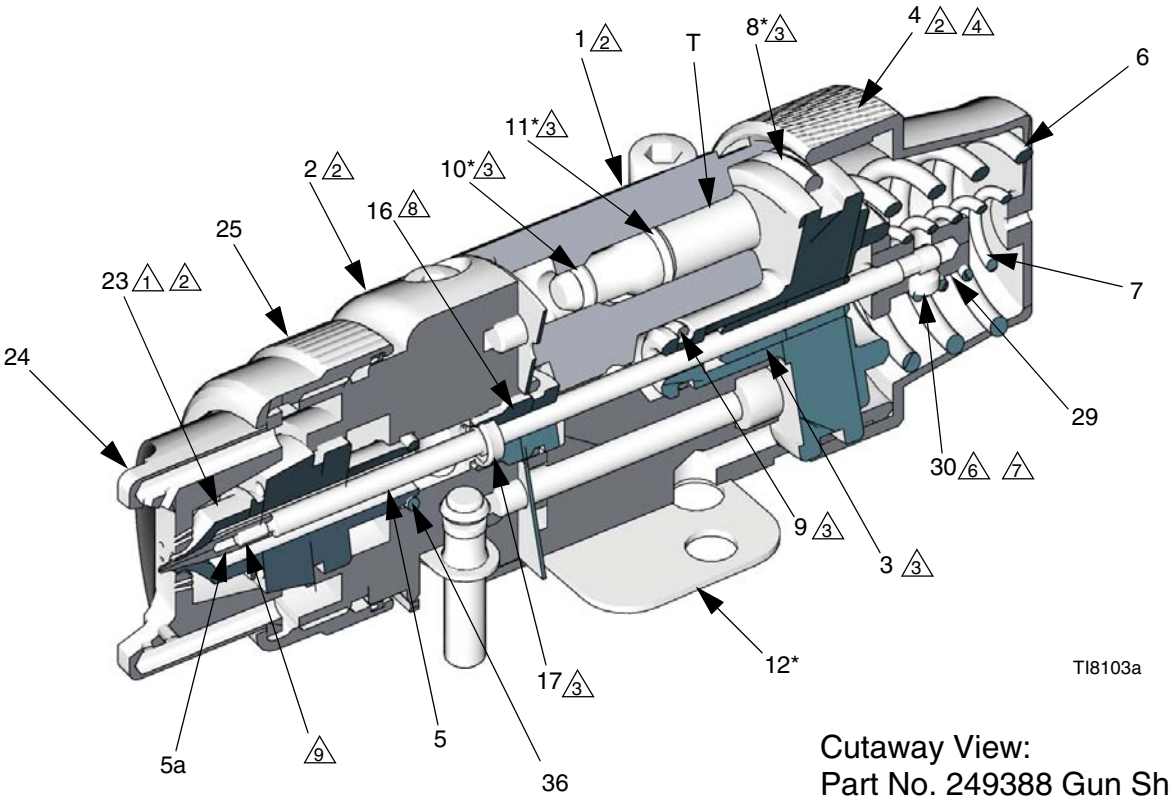
13. Remove all o-rings from the piston (3) and stems (T). Check that the stems are solidly in place. If they are loose, replace the entire piston assembly (3).

14. Perform the following applicable step:

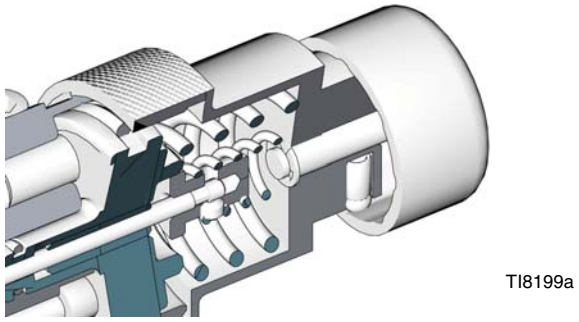
    a. *Non-circulating guns:* Remove the fluid outlet port plug (19), and gasket (22) from the fluid housing (2). Remove the o-ring (21) and backup (20) from the plug.

    b. *Circulating guns:* Remove the gasket (22) from the fluid housing (2).

15. Clean all parts and replace any worn parts. When assembling, lubricate the threads with anti-seize lubricant.



Cutaway View:
Part No. 249388 Gun Shown



Alternate Fluid Control Shown

SERVICE NOTES:

1 Torque to 35-45 in-lb (4.0-5.1 N•m)

2 Lubricate threads with anti-seize lubricant

3 Lubricate with light-weight oil

4 Tighten cap (4) until it bottoms out

6 Apply semi-permanent anaerobic sealant

7 Torque to 4-5 in-lb (0.45-0.57 N•m)

8 Torque to 95-105 in-lb (10.7-11.8 N•m)

9 Apply semi-permanent anaerobic sealant to two threads at end of needle shaft.

FIG. 21

Reassembly

1. *Non-circulating guns only:* Lubricate the backup ring (20†) and o-ring (21†) and install them on the fluid outlet port plug (19). Install the plug in the fluid outlet port of the fluid housing (2). See FIG. 22.

2. *All guns:* Reinstall the gasket (22) in the fluid housing (2).

3. Install the o-rings (8*, 9*) on the piston (3). Install the two o-rings (10*, 11*) on each of the piston stems (T). Lubricate all the o-rings, the piston, and the piston stems.

4. Remove the protective paper from the sticky side of the gasket (12*) and adhere the gasket to the bottom of the piston housing (1), making sure the three holes in the gasket are properly aligned with the matching holes in the housing.

5. Lubricate the new fluid packing (17†) and insert it into the packing nut (16). Insert the packing nut into the fluid housing (2) and torque to 95-105 in-lb (10.7-11.8 N•m).

6. Align the gasket (15*) as shown in the exploded view in FIG. 22. Place the gasket on the piston housing (1), then install the fluid housing (2) onto the piston housing. Torque the two screws (14) to 30 in-lb (3.4 N•m).

   a. Insert the piston (3) into the piston housing (1).

   b. Ensure nozzle sealing o-ring (36) is installed in fluid housing (2).

7. To avoid galling of the fluid nozzle seat in the fluid housing, apply a thin film of lubricant to the threads. Install the nozzle into the fluid housing. Torque the nozzle securely to 60 in-lb (6.8 N•m).

   If you are replacing the needle tip (5a), apply semi-permanent anaerobic sealant to two threads at the end of the needle shaft. Assemble the needle tip to the shaft and hand tighten. Allow adequate time for the sealant to cure before installing the needle assembly into the gun.

8. Lubricate and install the needle (5) into the back of the gun assembly. Push it straight in through the piston.

9. Install the needle stop (29) on the needle. Coat the setscrew (30) with semi-permanent anaerobic sealant and install the screw into the needle stop. Torque to 4-5 in-lb (0.45-0.56 N•m). Pull on the needle to make sure it seats fully.

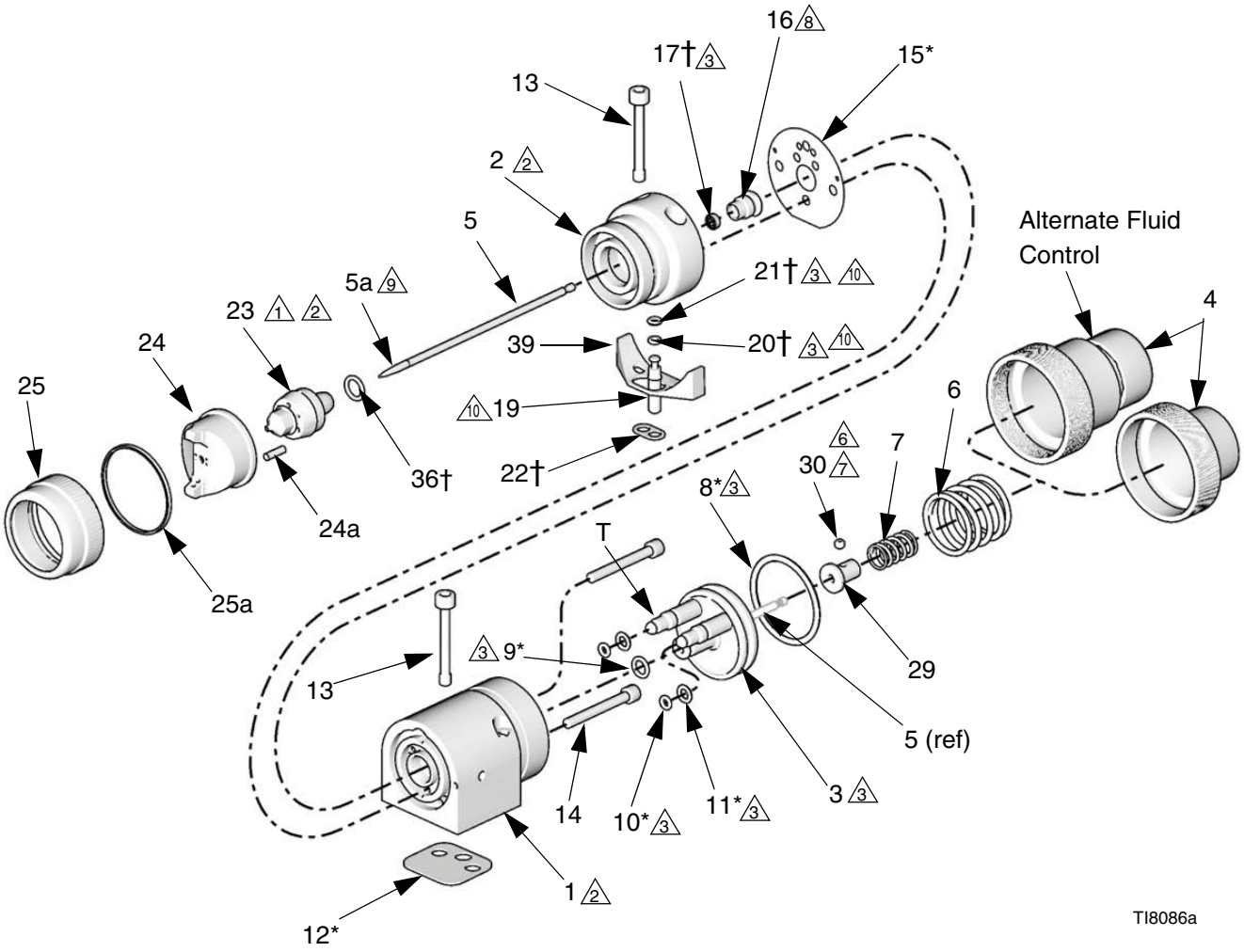
10. Install the springs (6, 7).

11. Lubricate the threads of the piston housing (1). Screw the cap (4) onto the housing until it bottoms out.

12. Install the air cap (24) and air cap retainer (25).

13. Reinstall the gun on the manifold using the four screws (13). Start the threads of all four screws. Tighten the front two screws first, and then tighten the back two. Torque all four screws evenly to 65 in-lb (7.3 N•m).

Parts



Exploded View:
Part No. 249369 Gun Shown

SERVICE NOTES:

1. Torque to 35-45 in-lb (4.0-5.1 N•m)
2. Lubricate threads with anti-seize lubricant
3. Lubricate with light-weight oil
4. Tighten cap (4) until it bottoms out
6. Apply semi-permanent anaerobic sealant
7. Torque to 4-5 in-lb (0.45-0.57 N•m)
8. Torque to 95-105 in-lb (10.7-11.8 N•m)
9. Apply semi-permanent anaerobic sealant to two threads at end of needle shaft.
10. Used on non-circulating guns only

FIG. 22

Parts

Ref. No.	Part No.	Description	Qty.
1		BODY	1
2	15H321	HOUSING, fluid	1
3	240895	PISTON, assy	1
4		CAP, piston	1
	192453	standard models	
	288091	fluid control models	
5★		NEEDLE, assy	1
5a★		TIP, needle	1
6	114139	SPRING, compression	1
7	114138	SPRING, compression	1
8*	115066	PACKING, o-ring, fluoroelastomer	1
9*	111450	PACKING, o-ring, fluoroelastomer	1
10*	111504	PACKING, o-ring, fluoroelastomer	2
11*	112319	PACKING, o-ring, fluoroelastomer	2
12*	114134	GASKET, polyethylene (bottom)	1
13	15H317	SCREW, mounting manifold (M5)	4
14	15H318	SCREW, SHC	2
15*	15H316	GASKET, polyethylene (front)	1
16	195222	NUT, packing	1
17†	115347	PACKING, u-cup	1
19	192687	PLUG, fluid	1
20†	114340	RING, back-up, PTFE	1
21†	114244	PACKING, o-ring, fluoroelastomer	1
22†	192443	GASKET, fluid	2
23★		NOZZLE, fluid, 0.030 in.	1
24★		CAP, air	1
	288133‡	Airspray (315 cap)	
	288134‡	HVLP (321 cap)	
	288132‡	Compliant (006 cap)	
24a	15G618	PIN, locating, threaded	2
25	239953	RETAINER, ring, assy	1
25a	192760	PACKING, u-cup	1
29	192452	STOP, needle	1
30	114137	SCREW, set	1
34❄	114141	WRENCH, hex	1
36†	113137	PACKING, o-ring	1
38❄		PIN, dowel	1
39	15H702	INSERT, plastic	1

★ *See spray gun assemblies table (page 28) for part number.*

† *Included in Fluid Seal Repair Kit 288135.*

* *Included in Air Seal Repair Kit 288171.*

❄ *Not shown.*

Air Caps

Orifice Size	Large Pattern (315) Air Spray	HVLP (321)	Compliant (006)	Medium Pattern (316) Air Spray	Small Pattern (313) Air Spray
0.030-0.070 (0.8-1.8)	288133	288134	288132	234758	234756
0.086 (2.2)	234760	234754	N/A	N/A	N/A
0.110 (2.8)	234761	234755	N/A	N/A	N/A

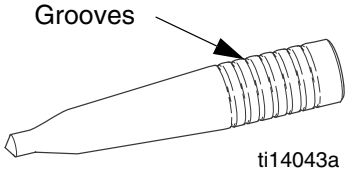
Spray Gun Assemblies (all models)

Gun Part No.	Needle/Nozzle Kit Includes items 5 & 23	Item 5 Needle Assy. Includes item 5a	Item 5a Needle Tip Pack of 5	Item 23 Nozzle	Item 24 Nozzle Orifice Size in. (mm)
249388 249407 249369 249396† 249411† 249377†	15F829	288175	288183	234741	0.030 (0.75)
249388 249407 249369 249397† 249412† 249378†	15F830	288176	288184	234742	0.042 (1.0)
249390 249409 249371 249398† 249413† 249379†	15F831	288177	288185	234744	0.055 (1.4)
249391 249410 249372 249399† 249414† 249380†	15F832	288178	288187	234746	0.070 (1.8)
249394* 288049* 249375*	15F835	288181*	234781 (Qty. 1)	234749	0.042 (1.0) Hardened SST
249395* 288050* 249376*	15F836	288182*	234782 (Qty. 1)	234750	0.055 (1.4) Hardened SST

** Guns with stainless steel needle tip, which is not recommended for thin fluids.*

† *Guns with Fluid Control Knob.*

Alternate nozzle sizes are also available. See **Accessories**, page 33.



Needle Tips

Grooves	Needle Tip
0	234781 or 234782
2	288183
3	288184
4	288185
5	288187

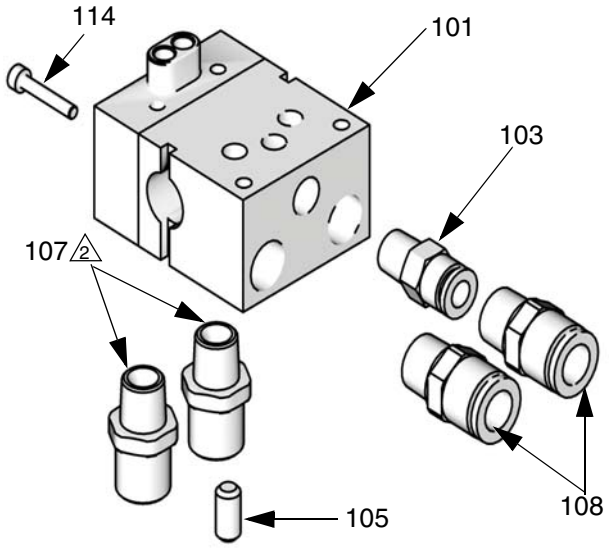
Part No. 288221

Manifold with bottom fluid ports

Ref. No.	Part No.	Description	Qty.
101		MANIFOLD, bottom fluid ports	1
103	120388	FITTING, tube, air inlet; 1/4 in. OD tube x 1/8 npt(m)	1
105	114246	SCREW, set; 5/16;0.437 in. long	1
107	166846	NIPPLE, SST; 1/4 npsm, straight pipe thread x 1/4 npt	2
108	120389	FITTING, tube, air line; 3/8 in.OD tube x 1/4 npt	2
109❄	101970	PLUG, pipe, SST; 1/4-18 ptf, supplied to plug fluid outlet port in non-circulating applications	1
114	120453	SCREW, SHCS, M3 x 18	1

❄ *Not shown.*

△2 Apply anti-seize lubricant (222955) to threads and mating faces of manifold (101) and any fittings and/or plugs used in fluid ports.



TI9398c

FIG. 23: Manifold with Bottom Fluid Ports

Part No. 288217

North America Manifold with side fluid ports

Part No. 288218

International Manifold with side fluid ports

Ref. No.	Part No.	Description	Qty.
101		MANIFOLD, side fluid ports	1
103			1
	120388❖	FITTING, tube, air inlet; 1/4 in. OD tube x 1/8 npt(m)	
	120538◆	FITTING, tube, air inlet; 6 mm OD tube x 1/8 npt(m)	
105	114246	SCREW, set; 5/16;0.437 in. long	1
107			2
	114342❖	ELBOW, street, 1/4 in. npt	
	114247◆	FITTING, elbow, male; #5 JIC x 1/4 npt	
108			2
	120389❖	FITTING, tube, air line; 3/8 in.OD tube x 1/4 npt	
	120537◆	FITTING, tube, air line; 8 mm OD tube x 1/4 npt	
109❄	101970	PLUG, pipe, SST; 1/4-18 ptf, supplied to plug fluid outlet port in non-circulating applications	1
114	120453	SCREW, SHCS, M3 x 18	1

❄ *Not shown.*

❖ *Part No. 288217 only.*

◆ *Part No. 288218 only.*

△2 Apply anti-seize lubricant (222955) to threads and mating faces of manifold (101) and any fittings and/or plugs used in fluid ports.

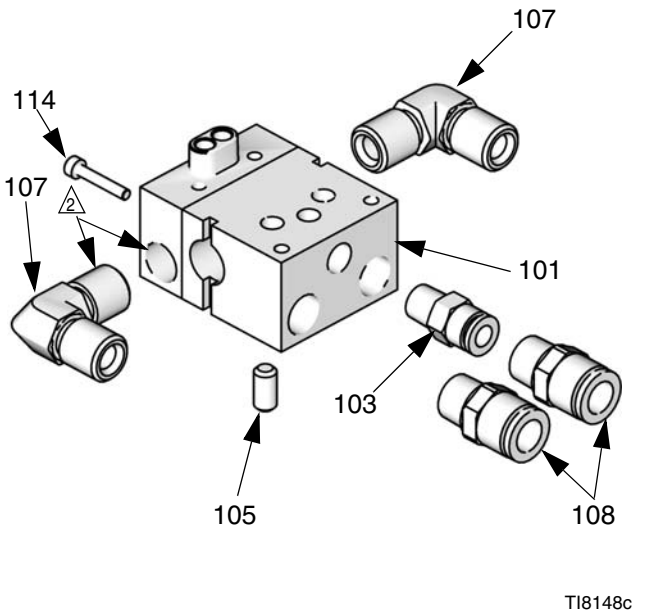


FIG. 24: Manifold with Side Fluid Ports

Part No. 288223

Low Pressure Manifold with side fluid ports and fan adjustment valve

Ref. No.	Part No.	Description	Qty.
101		MANIFOLD, fan adjustable	1
102	243949	VALVE, fan, assy.	1
103	120388	FITTING, tube, air inlet; 1/4 in. OD tube x 1/8 npt(m)	1
104	120389	FITTING, tube, air line; 3/8 in.OD tube x 1/4 npt	1
107	114246	SCREW, set; 5/16;0.437 in. long	1
108	114342	ELBOW, male, 1/4 - 18 npt	2
109❄	101970	PLUG, pipe, SST; 1/4-18 ptf, supplied to plug fluid outlet port in non-circulating applications	1
114	120453	SCREW, SCHS, M3 x 18	1

❄ *Not shown.*

△2 Apply anti-seize lubricant (222955) to threads and mating faces of manifold (101) and any fittings and/or plugs used in fluid ports.

△3 Install with valve turned fully counterclockwise to outermost position.

△4 Torque to 125-135 in-lb (14-15 N•m).

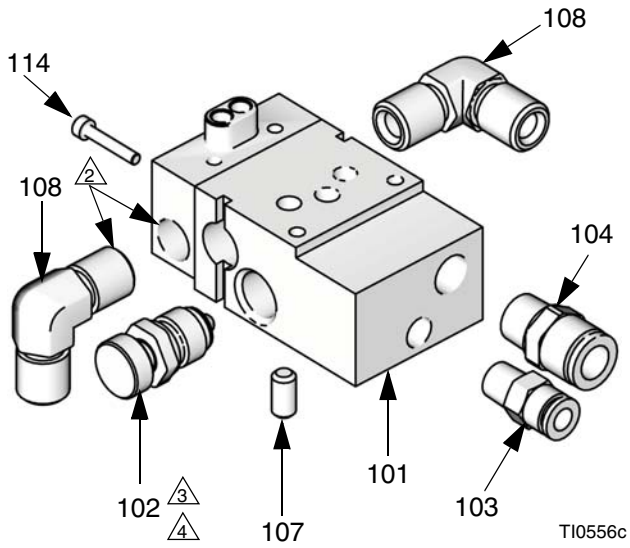


FIG. 25: Side Fluid Ports and Fan Adjustment Valve

Part No. 288160
Rear Port Manifold, North America

Part No. 288211
Rear Port Manifold, International

Ref. No.	Part No.	Description	Qty.
101		MANIFOLD, aluminum	1
103		FITTING, fluid path	2
	15H521❖	1/4 npsm	
	15J003◆	#5 JIC	
105	116475	SCREW, SHCS, M4 x 12	2
106	120353	O-RING, PTFE	2
107	15J077	O-RING, PTFE	2
110	114246	SCREW, set, hex soc	1
111			2
	120389❖	FITTING, tube, air line; 3/8 in.OD tube x 1/4 npt	
	120537◆	FITTING, tube, air line; 8 mm OD tube x 1/4 npt	
112			1
	120388❖	FITTING, tube, air inlet; 1/4 in. OD tube x 1/8 npt(m)	
	120538◆	FITTING, tube, air inlet; 6 mm OD tube x 1/8 npt(m)	
113	103253	SCREW, set	2

❖ *Part No. 288160 only.*

◆ *Part No. 288211 only.*

1 Apply sealant to threads and mating faces of manifold (101) and any fittings and/or plugs used in fluid ports.

2 Torque to 30-42 in-lb (3.4-4.7 N•m).

3 Torque to 110-130 in-lb (12.3- 14.7 N•m).

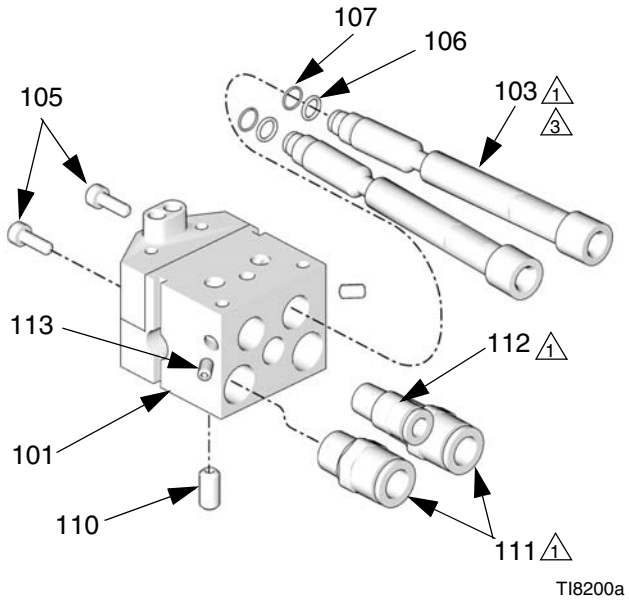


FIG. 26:

Accessories

Cleaning Brush 105749

For use in cleaning gun.

Lubricant 111265

One 4 oz. (113 gram) tube sanitary (non-silicone) lubricant for fluid seals and wear areas.

Fluid Hose Parts Breakdown

Part No.	Description
239629	FITTING, assy, swivel
061345	TUBING, 1000 ft. (305 m) roll

Alternate Nozzle Sizes

Nozzle Orifice Size in. (mm)	Needle/ Nozzle Kit	Needle Assy.	Needle Tip Qty. 1	Nozzle
0.059 (1.5)	N/A	288177	234778 (6 grooves)	234745
0.086 (2.2)	15F833	288179	234779 (0 grooves)	234747
0.110 (2.8)	15F834	288180	234780 (0 grooves)	234748
0.070 (1.8) Hardened SST	N/A	288182	N/A	234751

Retrofit Adapter Plate 288197

The retrofit adapter plate enables the manifold to be attached to a variety of bolt patterns.

HVLP Pressure Verification Kit

For use in checking air cap atomizing or pattern air pressure at various supply air pressures. Not to be used for actual spraying.

Install the kit air cap on the gun. Turn on the air to the gun, then trigger the gun and read the air pressure on the gauge.

To be “HVLP compliant”, the atomizing air pressure must not exceed 10 psi (70 kPa, 0.7 bar).

Part No.	Orifice in. (mm)
234736	0.030 - 0.070 (0.8 - 1.8)
234737	0.086 (2.2)
234738	0.110 (2.8)

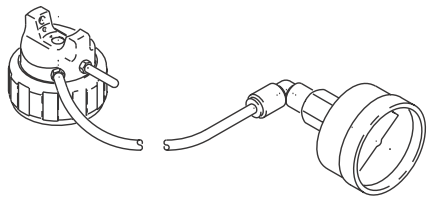


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FIG. 27: HVLP Pressure Verification Kit

Fluid Control Knob Repair Kit 288138

Includes spring, ball, and retaining clip.

Dimensions

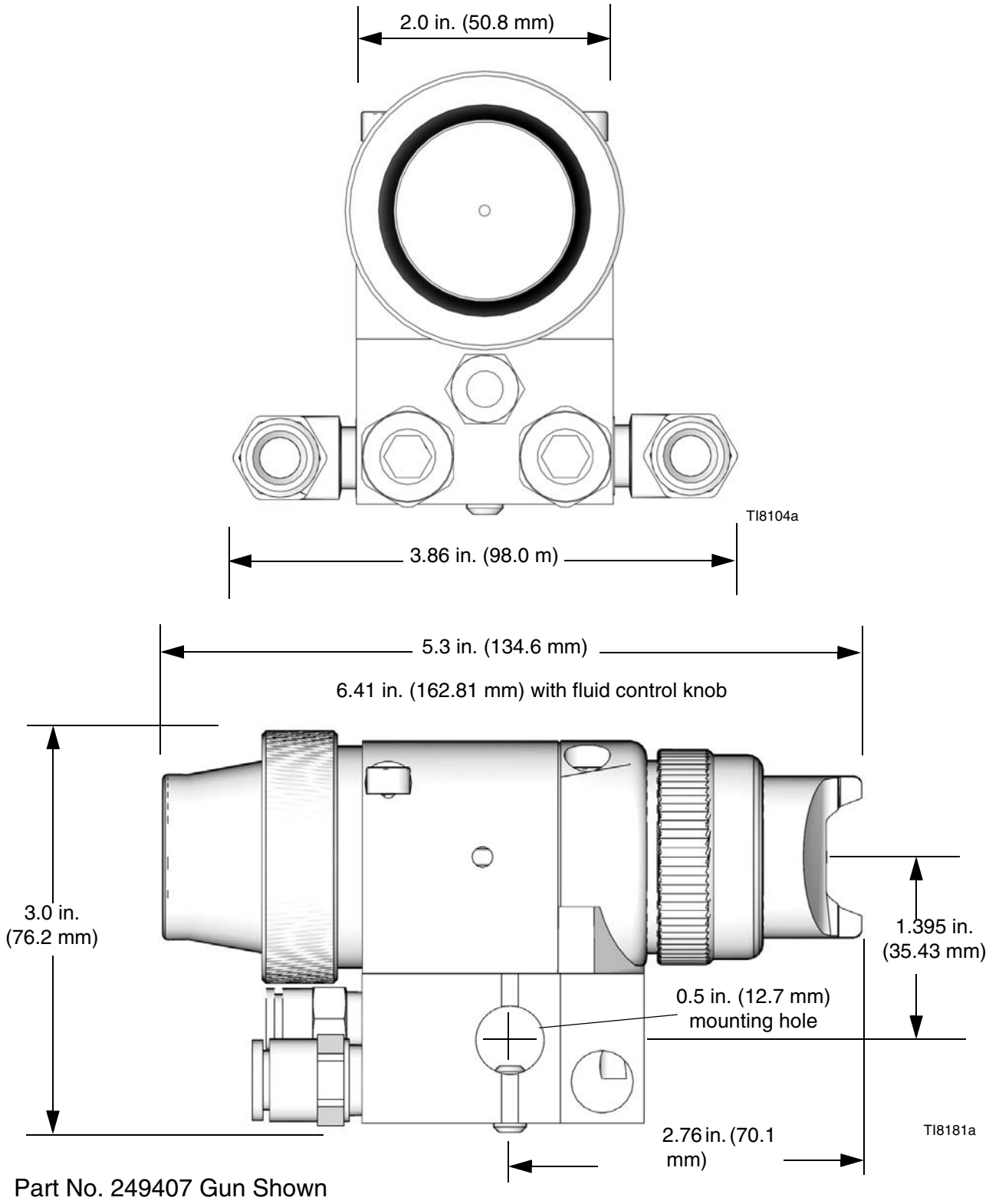


FIG. 28

Mounting Hole Layout

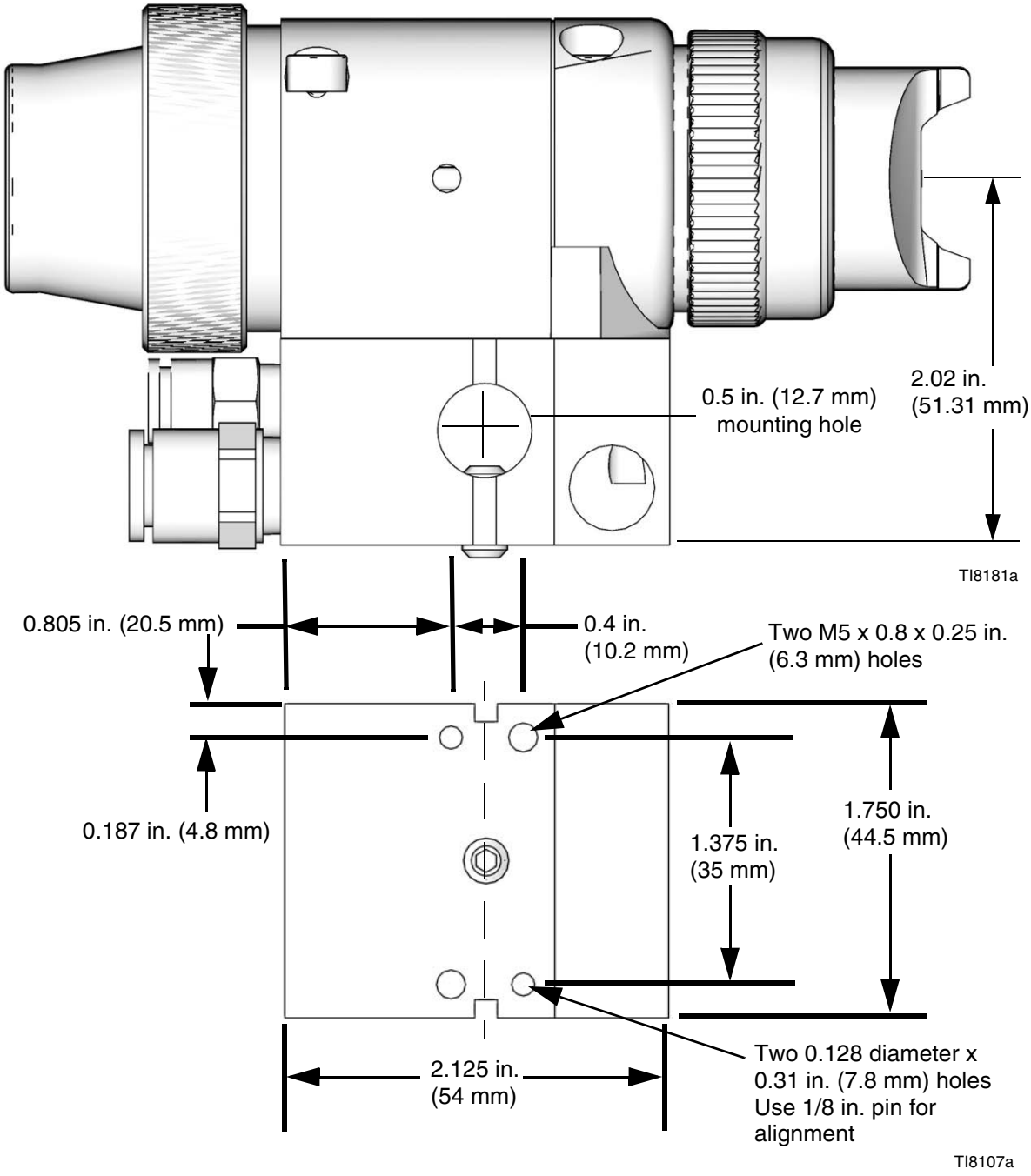
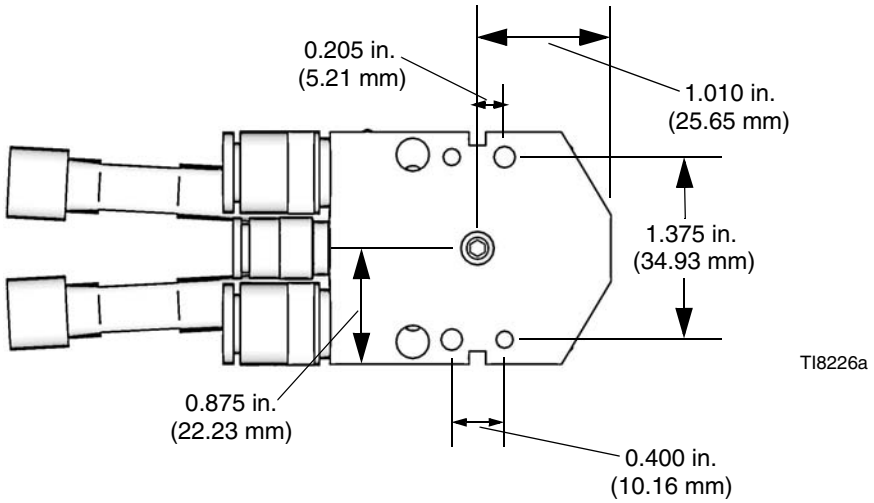


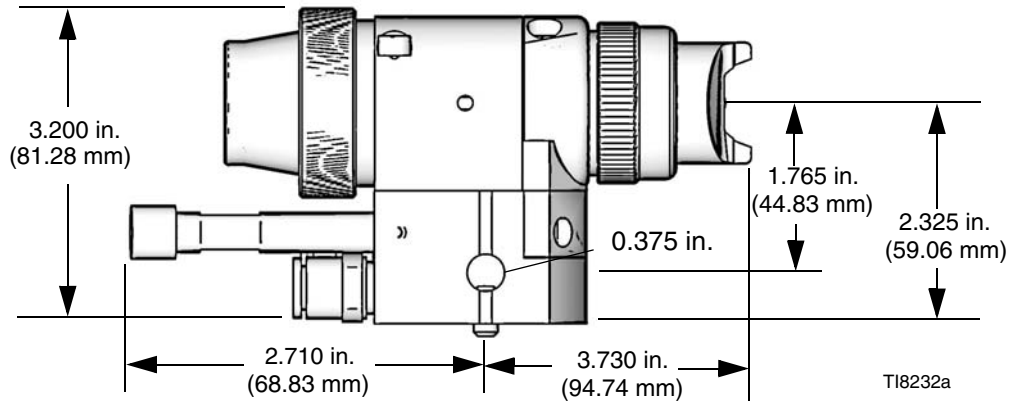
FIG. 29: Manifold Mounting Hole Layout

Mounting Hole Layout

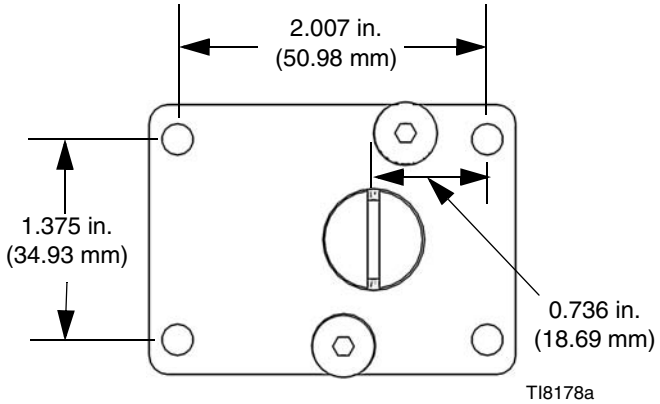
Rear Port Manifold



Rear Port Manifold



Retrofit Adapter Plate



Gun with Retrofit Adapter Plate

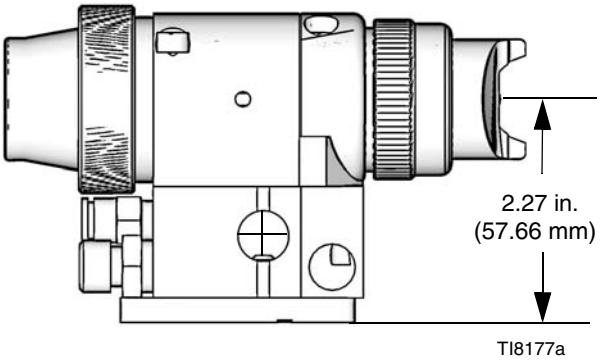


FIG. 30: Mounting Hole Layouts

Technical Data

Maximum Working Fluid Pressure	100 psi (0.7 MPa, 7 bar)
Maximum Working Air Pressure	100 psi (0.7 MPa, 7 bar)
Maximum HVLP Inbound Air Pressure	35 psi (25 kPa, 2.5 bar)
Maximum Compliant Gun Inlet Pressure	30 psi (21 kPa, 2.1 bar)
Maximum Working Fluid Temperature	120° F (49° C)
Minimum Air Cylinder Actuation Pressure	50 psi (0.34 MPa, 3.4 bar)
Weight	1.5 lbs (992 g)
Wetted Parts	Stainless Steel, Ultra High Molecular Weight Polyethylene, Chemically Resistant Fluoroelastomer, Acetal, PTFE, PEEK

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Triggering Speed

These values apply to a new gun with a 12 ft. (3.6 m), 1/4 in. (6.3 mm) OD cylinder air line and a 0.055 in. nozzle. These values will vary slightly with use and with variations in equipment.

Cylinder Air Pressure psi (kPa, bar)	**Fluid Pressure** psi (kPa, bar)	**Air Pressure** psi (kPa, bar)	**msec to fully open**	**msec to fully close**
50 (0.35, 3.5)	50 (0.35, 3.5)	100 (0.7, 7.0)	58.4	50.4

Sound Data (dBa)

Air Cap Part No.	**Nozzle Part No. and Size**	**Atomizing Air Pressure** psi (kPa, bar)	**Fan Air Pressure** psi (kPa, bar	**Sound Pressure dB(A)†**	**Sound Power dB(A)‡**
288134	234744, 0.055 in.	35 (250, 2.5) 100 (0.7, 7.0)	35 (250, 2.5) 100 (0.7, 7.0)	85.9 97	86.7 92.8

† Sound pressure measured 3.28 ft. (1 m) from equipment.

‡ Sound power measured per ISO 9614-2.

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